Geologische Methoden B
Digital Mapping

Master-course

Geologische Wissenschaften

LMU Munich

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Overview

Aim

- Create your own *map*
- in *digital* format
- by modern techniques such as
    - *laser scanning*
    - *GPS/GNSS*

Method

- Local map by laser scanning
- Global coordinates from GPS/GNSS
    - Post-processing stationary
    - Real time kinematic
    - Post-processing kinematic
- Coordinate transformations
    - Between successive scans
    - From local to global coordinates

Laser scanning

- Goal: high resolution 3d mapping
  - Local coordinates from scans
  - Colors from digital photography
  - Result: digital image with 3d information in local coordinates
- Steps:
  - Theory
  - Practical observations
  - Processing
    - Processing single scans
    - Coordinate transformations of successive scans

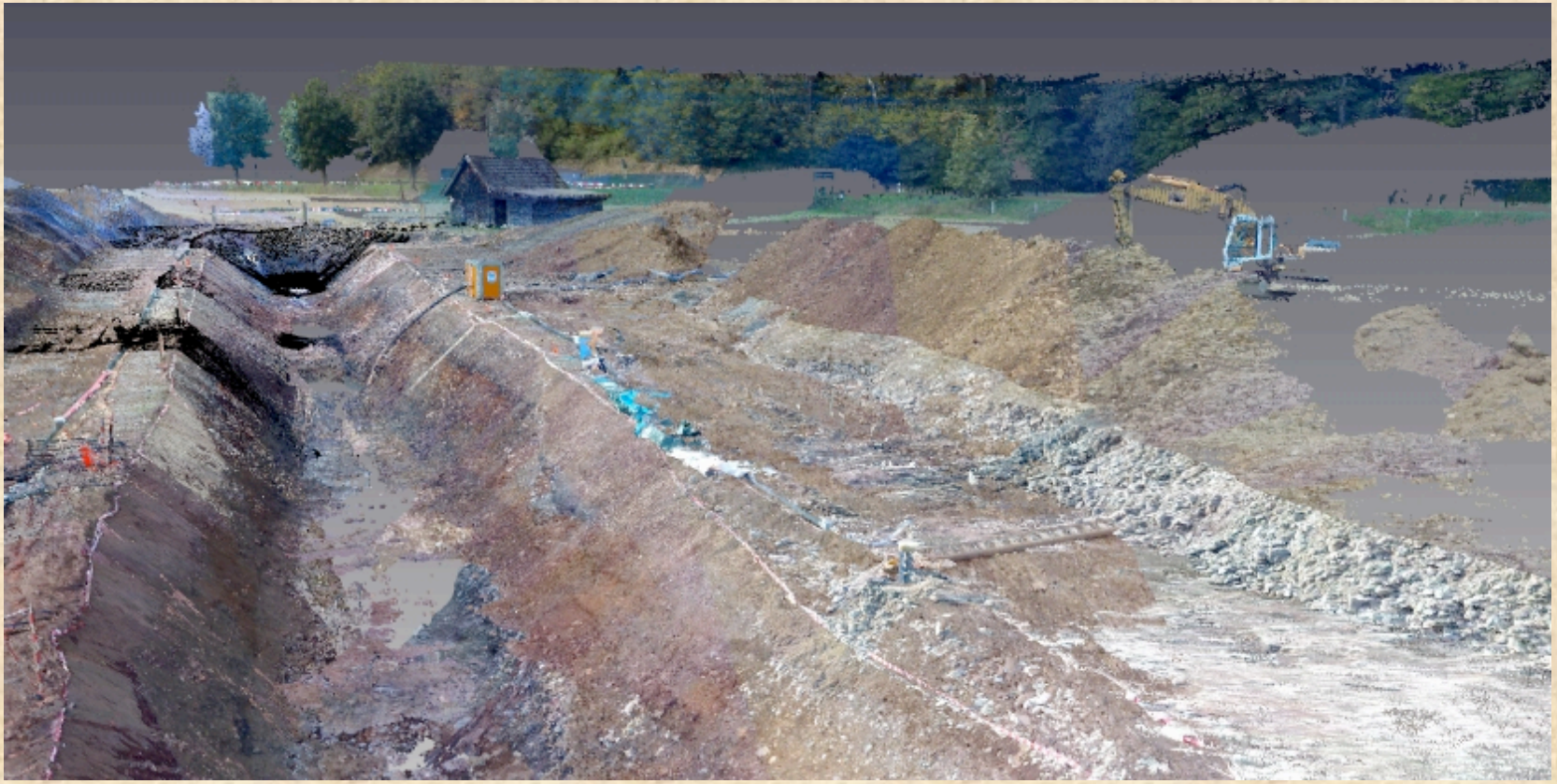
Satellite Technique (GPS/GNSS)

- Goal: Transform laser scans from local to global coordinates
- Steps:
  - Theory
  - Setting up reference station(s) in the scan area
  - Looking for the closest permanent stations with public data
  - Processing observations in a combination with available permanent stations
  - Kinematic GNSS positioning of a few scanned points

Work flow

- 03.05.2011: Detailed course plan
- ~3 sessions of theory
- 2/3 single days of field observations around Munich
- Processing
- Learning by doing, reading instruction manuals of the instruments and softwares
- Writing a report
- Oral exam

Example Image with 3 dimensional coordinates and color texture



Adopted from PhD research of Simon Kuebler, LMU Geology, "Paleoseismology of the Lower Rhine Embayment"